Ontario

A Dairy Farm Example:

Your Livestock Operation Under the Nutrient Management Act, 2002

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Introduction 2

Part 1: How does the Nutrient Management Act, 2002, affect farmers? 3

Part 2: A Dairy Free-stall Example 13

Part 3: Implications of the Nutrient Management Strategy and/or Plan - A Summary 17

Conclusion 21

Appendices

Introduction 22

A *Concept of a Farm Unit Sketch* 24

B *Concept of a Field Sketch and Manure Spreading Restrictions* 25

C *Soil Lab Test Results* 26

D *Manure Contingency Plan (Sample)* 28

E *Farm Unit Declaration Form* 31

F *Nutrient Management Strategy and/or Plan Sign-Off Form* 39

G *Engineer's Commitment Certificate* 40

Acknowledgements 42

Introduction

This booklet is part of a series of livestock information books developed to help farmers understand the implications of the Nutrient Management Act, 2002 and the associated regulations and protocols. The act addresses how nutrients, including manure, are managed while they are stored and applied to farmland for the purpose of growing agricultural crops.

For more information, or to see all of the titles in this series, visit the OMAFRA Web site at **www.omafra.gov.on.ca** or call the Agricultural Information Contact Centre at 1-877-424-1300.

For more information on provincial acts and regulations, visit the Ontario Statutes and Regulations Web site at **www.e-laws.gov.on.ca**. You can access the applicable forms online at **www.gov.on.ca**.

The farm operation information used in this booklet is not based on any existing farming operation and is for demonstration purposes only.

Some Common Acronyms

The Nutrient Management Act, 2002 brought with it new terms that have quickly become common, and are usually abbreviated. These include:

Manure Storage Software Program	MSTOR
Minimum Distance Separation	MDS
Nutrient Management Act, 2002	NMA or act
Nutrient Management Computer Program	NMAN
Nutrient Management Strategy	NMS
Nutrient Management Plan	NMP
Nutrient Unit	NU
Nutrient Management Act, 2002 General Regulation	O. Reg. 267/03 or the regulation

Farmers planning to apply for a building permit for a livestock barn and/or permanent manure storage, and those with large operations, need to be aware of the recent nutrient management legislation. This booklet reviews two key documents – the Nutrient Management Strategy (NMS) and the Nutrient Management Plan (NMP) – and the requirements that must be met in order to obtain approval of the NMS and/or NMP (NMS/P). An NMS/P will assist the agricultural operator in managing nutrients in a way that will be environmentally friendly and economically viable. An approved NMS/P can be used in the process of obtaining a building permit for a new or expanding nutrient storage facility. Many of the requirements in the regulation do not come into force until the farmer is required to have an NMS or NMP.

Nutrient Units and Compliance Schedule

All farms planning on building a barn or manure storage (including earthern storage) located within 100 m of a municipal well or applying non-agricultural source materials (NASM) are now affected by the NMA. In addition, farms ≥ 300 NU are also affected by the act. The size of the agricultural operation is determined by the number of nutrient units (NUs) on that agricultural operation. An NU is defined as having the fertilizer equivalent of 43 kg of nitrogen or 55 kg of phosphorus (whichever is lower). NUs were created to enable the fair comparison of various nutrient types including agricultural, non-agricultural and commercial products (in essence an apples-to-apples comparison). A farm is defined as land no smaller than a single deed that meets the requirements of section 5 of the regulation.

How does the Nutrient Management Act, 2002, affect farmers?

The table below provides examples of the number of animals needed to make one NU. A complete listing for a variety of livestock can be found in the Farm Unit Declaration Form in the Appendices Section.

Number of Animals per Nutrient Unit on Farm Units Generating Manure

Type of Animal	Nutrient Units (animals/ NU)
Beef Cows – Includes calves to weaning	1.0
Beef Shortkeep (12.5 – 17.5 months)	2.0
Beef Backgrounders (7 – 12.5 months)	3.0
Beef Feeders (7-16 months)	3.0
Chicken Broilers (8 week cycle)	351
Chicken Broilers (9 week cycle)	300
Chicken Broilers (10 week cycle)	250
Chicken Broilers (12 week cycle)	100
Chicken – Broiler Breeder Growers (females + males transferred out)	300
Chicken – Broiler Breeder Layers (females + males transferred in)	100
Dairy Cow – Milking Age Large Frame	0.7
Dairy Heifers – Large Frame	2.0
Dairy Calves – Large Frame	6.0
Horses – Large Frame	0.7
Horses – Medium Frame	1.0
Horses – Small Frame	2.0
Sheep – Meat Ewes and Rams (including unweaned offspring and replacements)	8.0
Sheep –Feeder Lambs	20.0
Sheep - Dairy Ewes and Rams (including unweaned offspring and replacements)	6.0
Swine Feeders	6.0
Swine Sows – Dry and Boars Non-SEW	3.5
Swine Sows – Dry and Boars SEW	3.33
Swine Sows – With Litters Non-SEW	3.5
Swine Sows – With Litters SEW	3.33
Swine – Weaners Non-SEW	20.0
Swine – Weaners SEW	20.0
Turkey – Toms > 10.8 kg	76
NOTE: For animals not listed on the chart above, the number of animals per nutrient unit can be calculated by determining the number of animals that will produce the amount of nutrients that give the fertilizer replacement value of the lower of 43 kilograms of nitrogen or 55 kilograms of phosphate as nutrient.	

Nutrient Management Strategy and Nutrient Management Plan

The focus of the new act is the requirement for a NMS/P.

An NMS describes the generation, storage and destination of the nutrients produced. Essentially, in completing a NMS, farmers answer the questions "How much manure is being produced?", "How is the manure stored?" and "Where is the manure to go?" People who own or control a livestock operation that has been phased-in must complete a NMS.

An NMP determines the details of how the generated nutrients (i.e., manure) are to be applied to a given land base. The NMP optimizes the application of nutrients to crops and enhances protection for ground and surface water.

All farm units ≥ 300 NU, and within 100 m of a municipal well, that generate nutrients and apply those nutrients to the land must prepare a NMP once the farm unit has been phased-in under the NMA.

An NMP determines the rate and timing of application of manure based on a number of different factors. These factors include:

- existing soil nutrient levels as determined through soil testing at an OMAFRA-accredited lab;
- nutrient content of the manure as determined through testing or book values;
- crops to be grown in the next five years;
- crops grown on the land in the past year;
- soil type and slope of the land;
- tillage practices used;
- method and timing of manure application;
- manure applications over the past three years; and
- proximity to surface water, including wells.

Completion of the NMS and NMP

There are two ways to complete an NMS/P. You can either complete the documents yourself or hire a certified consultant. Any person who prepares the NMS/P will need provincial certification.

Do It Yourself

There are several tools that can help you complete an NMS/P, two of which are:

- NMAN Software – a computer program developed by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) that contains all of the forms and calculations necessary for a complete NMS/P, with the exception of the required sketches. OMAFRA offers training on how to complete a strategy or plan that includes using the NMAN software.
- NMAN Workbook – a paper version of the key elements of the NMAN program. OMAFRA offers a training course on the theory and science behind NMAN and the NMAN workbook with an opportunity to use this tool. The software does provide greater detail in some areas.

To complete your NMS and/or NMP, you will need some additional forms (e.g., Farm Unit Declaration, Nutrient Management Strategy and/or Plan Sign-Off, Engineer's Commitment Certficiate). These can be accessed at **www.gov.on.ca**.

You may choose to use another software application. However, OMAFRA only offers technical support for NMAN software.

Farmers who choose to do their own NMS/P must obtain the following certificate:

Certificate Title	For	Timeline
Agricultural Operation Planning Certificate	Agricultural operators who plan to prepare their own NMS/P	Must be certified before submitting their strategy or plan for approval

A list of the necessary courses, dates and locations are available by calling the Agricultural Information Contact Centre (AICC) at 1-877-424-1300 or from the OMAFRA Web site at **www.omafra.gov.on.ca**.

Hire a Consultant

Many farmers hire consultants to complete their NMS/P on a fee-for-service basis. Anyone completing plans and strategies for others must be certified by OMAFRA. A list of consultants that are certified by OMAFRA can be obtained by contacting the AICC at 1-877-424-1300 or from the OMAFRA Web site at **www.omafra.gov.on.ca**.

Consultant fees will vary, depending on the complexity of the situation and the acreage involved. Plans must be updated every five years and reviewed on an annual basis.

If events listed in section 22 or 26 of the regulation occur to the operation prior to the five-year mark, then the NMS/P must be updated. Minor changes to a strategy or plan (e.g., fall spreading versus spring spreading) must be documented and require the farm operator to update the NMS/P to ensure the appropriate utilization of the manure.

Regardless of who completes the NMS/P, it is the responsibility of the farmer to ensure that the NMS/P is implemented and that all nutrient application activities are documented.

Planning for the expansion or upgrading of a farm operation can also include a number of important business planning and financial management decisions. The Canadian Farm Business Advisory Service provides low cost access to qualified independent business management consultants who can help you assess the financial performance of your current operation, consider your business options, and develop a full set of projections for any planned changes.

The Canadian Farm Business Advisory Service has three program components:

The Farm Business Assessment provides up to five days of consultation with a qualified farm business advisor to assess your current business, look at your business planning options, and develop financial projections for the changes and options you are considering. Eligible producers can access this service for a nominal fee of $100. A list of qualified advisors providing this service in your area is available by contacting Canadian Agri-Renewal Services at the telephone number below.

The second component, Specialized Business Planning Services, is available to producers who require a more specialized business plan for a major business change – such as an expansion plan or farm succession plan. This program offers government assistance of up to 50%, to a maximum of $8,000, to help offset the cost of hiring qualified consulting services.

The third component, Planning and Assessment for Value Added Enterprises, focuses specifically on assessing the feasibility and business planning needed before establishing or expanding ventures designed to add value to agricultural products. This program also provides assistance of up to 50% of the cost of consulting services – to a maximum of up to $10,000 per producer.

Information on any of these business planning services is available by calling Canadian Agri-Renewal Services toll free at 1-866-452-5558. Producers in Northern Ontario can call 1-800-461-6132.

Phase-in Periods

Livestock farms will be required to comply with the NMA as per the following schedule:

Size of Operation (in NU)	Phase-in	NMS/NMP
≤5	Not affected	Not required
Operations ≥300 (Existing or Expanding)	September 30, 2005	NMS and NMP
New and Expanding* operations >5 and <300 NU	December 31, 2005	NMS (and NMP if applicable)

** Construction of structures to house farm animals or manure storage or the building of an earthen storage*

When submitting a plan, allow sufficient time for data collection, NMS/P preparation, review and approval. Errors in the NMS/P can result in the NMS/P being returned for clarification or correction and can cause delays in the approval process, thus extending the approval time. Keep in mind that some municipalities may require a NMS/P for farms not covered by the regulation. It is important to check with your municipality to determine whether there are additional requirements that must be met.

Building Permits for Phased-in Farms

The NMA outlines criteria that must be met for building new permanent manure storage facilities. While the NMA, regulations and protocols outline the criteria that must be met before a building permit is issued for a new permanent manure storage facility, there are additional requirements that you must also follow to satisfy the *Ontario Building Code, 1992.*

Engineered Plans and Construction Supervision

Once operations are required to have a NMS/P, there are standards that apply under the regulation for the construction or expansion of permanent nutrient storage facilities. These include external permanent manure storage facilities and in-floor storage structures in the barn. The regulation requires these facilities to be designed and their construction supervised by a professional engineer. The only exception is solid manure storages with a floor area of less than 600 m^2, walls less than 1.0 m high and a volume of less than 600 m^3. To obtain a building permit for a permanent liquid nutrient storage facility or a permanent solid nutrient storage facility ≥300 NUs and without a concrete floor, the engineer must submit a site plan, a geotechnical investigation report and detailed construction drawings. The engineer is responsible for inspection during the period of construction.

Site Plan

According to the NMA, a minimum distance must be maintained between the manure storage facility and various water sources.

Minimum Distance between the Permanent Manure Storage and:	Distance (metres)
A drilled well (>15 metres deep)	15
A municipal well	100
Other wells (dug, bored)	30 (90 if the facility will store non-agricultural source materials)
Surface water	50 (as measured along the flow path)
Field drainage tiles	15
Tile inlets	50 (as measured along the flow path)
A flood plain	No building within the 100-year flood line*

** Unless a permit has been obtained under Section 28 of the Conservation Authorities Act*

Surface water includes ponds, wetlands, lakes, rivers, creeks or artificial channels that support aquatic-type plants. A grassed waterway for erosion control is not considered surface water and neither is a dug-out pond as long as it has no connection to surface water (see section 2.(1) and (2) in the regulation for clarification).

The distance is measured from the permanent manure storage facility to the top of the bank, of surface water.

Minimum Distance Separation (MDS II) for Odours

The MDS formulas establish an appropriate distance separation between livestock barns, permanent manure storage facilities and neighbours. These are currently part of provincial land use policy. They are not a requirement of the regulation. Most municipalities have incorporated these guidelines into their zoning bylaws. In these cases, the MDS II distances will have to be met before a building permit is issued. The municipality can provide you with the necessary MDS II calculations based on information you supply.

Site Characterization

A professional engineer or geoscientist must complete a site characterization for a construction or expansion of a permanent liquid nutrient storage facility or a solid permanent nutrient storage facility ≥300 NUs without a concrete floor. The site characterization establishes the hydrogeologic characteristics of the soil and the depth to the groundwater or bedrock. The soil characterization may be done by a lab analysis of a soil sample, an on-site test, or, if the soil is very heavy, a visual assessment by a professional. The results of this investigation will determine the design criteria for a permanent manure storage facility. This chart shows under which circumstances these options must be used.

	Soil Conditions Required between the Tank Bottom and the Bedrock or Aquifer	Tank Design Details
1	• 1.0 m of hydraulically secure soil* or • 1.0 m of soil with more than 15% clay	• Unlined tank, unreinforced floor
2	• 0.5 m of hydraulically secure soil* or • 1.0 m of soil with at least 10% clay	• Unlined tank, reinforced floor
3	• 1.0 m of native undisturbed material or • 1.0 m of compacted granular material	• Lined tank, unreinforced floor
4	• 0.5 m of native undisturbed material or • 0.5 m of compacted granular material	• Lined tank, reinforced floor

**one having a maximum saturated hydraulic conductivity of 1 x 10^{-8} metres per second. This is determined by a lab test of the soil. It is roughly equivalent to a soil with at least a 20% clay content.*

Reinforcing the floor or lining the excavation is costly. Farmers should also consider moving the storage to a more suitable location.

Construction Drawings

Detailed construction drawings of the manure storage (concrete, steel or earthen) and of liquid manure transfer systems are to be provided by a professional engineer. The regulation lists specific design requirements that must be met.

Storage Capacity

The regulation requires a minimum of 240 days of nutrient storage capacity, which can be comprised of:

- the capacity of the storage, less an allowance for accumulated precipitation (for open-top structures) and a 0.3 m freeboard at the top;
- temporary storage of manure in the field (solid manure only); and/or
- off-site or off-farm storage capacity if it is identified/explained in the NMS/P.

The MSTOR computer program can determine the required manure storage volume. It is part of the NMAN program.

Options for periods less than 240 days are provided for situations described in the regulation (e.g. NMS, NMP, broker, animals inside for part of year).

When expanding nutrient storage, farmers may decide to:
- add enough storage to take the expanded operation up to 240 days of storage as per the minimum requirement, or
- build larger (e.g. up to a full year of storage).

A larger tank gives more flexibility and options for spreading times. Under the following conditions, this situation can be an advantage.

- **Wet conditions in fall** – severely restrict spreading opportunities. When followed by a wet spring, this can lead to tanks overflowing when storage capacity is borderline.
- **Light soils (e.g. sandy loam)** – as calculated in NMAN, it may be recommended that spreading be delayed until cooler fall weather, in order to retard the conversion of ammonium to nitrate and reduce the risk of groundwater contamination. If this is the case, 240 days of storage may be insufficient.
- **Circular manure tanks** – the extra storage can prove less costly, as a large economy of scale applies to circular manure tanks.

Consider whether the benefits of increased storage capacity outweigh the added capital cost.

Manure Transfer Systems

On phased-in farms, the pipes and the connectors used to drain pits and transfer the manure to long-term storage must now use gasketed fittings.

Manure Application Issues

There are several considerations that will affect the location of land available for manure application. A reduction in manure application rates may be caused by the buffer zones next to surface water or dug, drilled or municipal wells.

Buffer Zones

A vegetated buffer zone of at least 3 m width must be established next to any top of bank of surface water such as a lake, pond, ditch or creek that supports aquatic-type plants. This does not apply to a grassed waterway or a roadside ditch that has no stream. Within 10 m of this buffer strip, the manure will have to be injected or incorporated within 24 hours unless there is a living crop or at least 30% crop residue.

Water Wells

Manure, non-agricultural source materials and fertilizers are not to be applied closer than the distances shown below:

Well Type	Setbacks for Ag. Source Materials	Setbacks for Non-Ag Source Materials	Setbacks for Commercial Fertilizer/Compost
Municipal well	100 m	100 m	100 m
Drilled well*	15 m	15 m	3 m
Other wells	30 m	90 m	3 m

** Drilled well refers to a well with a minimum depth of 15 m, and a continuous watertight casing with a minimum depth of 6 m. Wells that meet these criteria are normally, but not necessarily, drilled.*

This example is based on a dairy free-stall farm operation owned by Ross Johnson. Ross plans to expand his operation from 100 to 200 milking cows. He will need to build a new barn to accommodate this growth. The new facility will require a building permit from the municipality, which will lead to Mr. Johnson's operation being phased-in under the MNA.

Summary of Farm Operation:

Present Operation:

Milking Herd Size: 100 milking Holsteins
Replacements: Heifers and calves raised on farm
Manure System: Cows and calves are on a liquid manure system and the heifers are on a bedded pack solid manure system
Manure Storage Capacity: 240 days of storage
Land Base: 197.2 ha (487 ac); 185.5 ha (458 ac) workable over three properties
Two barns exist on the farm:

- a 100 stall free-stall barn: 35 m (116 ft) x 28 m (92 ft)
- an older tie-stall barn: 46 m (150 ft) x 18 m (60 ft)

Proposed Expansion:

- Increase milking herd to 200 cows, continue to raise replacement animals
- Build new free-stall barn near existing barns
- Maintain existing barns with bedded packs for heifers and dry cows
- Build new manure storage to maintain minimum of 240 days of storage

NMS/P: Applicability of the NMA

Ross knows that the size of a livestock farm and whether it needs a building permit determines whether or not the farm will require a provincially approved NMS/P. It may also determine if the farm is subject to a number of other requirements.

Ross calculated how many NU his farm has now and how many it would have after he expands. Dairy farmers with large-framed animals like Holsteins can convert the number of cows to NU (when they keep replacements on the farm) by dividing the number of cows by 0.7. The results from Ross's calculations were as follows:

	Livestock Type Numbers	Livestock Numbers	Converison Factor	Total Nutrient Units
Present Operation	Milking Age Cows Large Frame	100	100/0.7	143
	Calves Large Frame	20	20/6	3
	Heifers Large Frame	80	80/2	40
			Total Nutrient Units	186
Expanded Operation	Milking Age Cows Large Frame	200	200/0.7	286
	Calves Large Frame	40	40/6	6
	Heifers Large Frame	160	160/2	80
			Total Nutrient Units	372

A Dairy Free-stall Example

Because Ross's expanded operation will be 300 nutrient units or more, Ross knows that he will need to have a provincially approved Nutrient Management Strategy (NMS) and Nutrient Management Plan (NMP) to get his building permit. In addition, he will also need to have a NMP prepared for the properties included in his farm unit. He will need to have a certified person prepare his strategy and plan.

An important result of completing the NMS/P will be the calculation of the amount of land required for manure application. This calculation will depend on several factors, including:

- the soil fertility levels, determined through soil testing at an OMAFRA accredited lab
- the nutrient content of the manure, determined through testing at an OMAFRA accredited lab or by using book values
- the crops to be grown in the next five years
- the crops grown in the past year
- the hydrologic soil group and slope of the land
- tillage practices used
- the method and timing of manure application
- manure application over the past three years
- proximity to surface water

Completing the NMS/P

Ross contacts OMAFRA to determine his options for completing his NMS and NMP and what land he needs to include in his farm unit. He may use any software program that deals with the components shown in Parts 5 and 7 of the Nutrient Management Protocol. If he prefers, he can use the "Nutrient Management Workbook," or the NMAN software, or hire a private consultant. Ross decides to hire a consultant to save him time, both in terms of completing the actual plan, and in terms of not having to take the training required to be certified to submit a plan for approval. After talking to some other farmers, he contacted several consultants and asked each specifically about their experience, cost, the services they would provide, and to ensure that they were certified by OMAFRA.

Municipal Requirements

Ross then meets with his municipal building inspector to discuss his building plans. He learns that a number of items will be required by his particular municipality. Before obtaining a building permit he needs the following information:

- Minimum Distance Separation II requirements (MDSII)
- Site Characterization Study for groundwater protection
- Siting restrictions for surface water protection
- Engineered plans
- Construction supervision and inspection

Minimum Distance Separation II (MDSII)

MDSI and MDSII are not requirements of the NMA. However, as in most municipalities in Ontario, the local zoning bylaw requires Ross to site his new barn according to the Minimum Distance Separation II formula. The municipal officials or Ross's certified consultant completed the calculations for Ross based on the information he supplied. Distances calculated from Ross's preferred site:

Neighbouring Land Use	Building	Manure Storage
Nearest neighbour's dwelling	207 m (680 ft)	260 m (854 ft)
Areas zoned or designated Agriculturally Related Commercial Use, Passive Recreational, or Industrial	207 m (680 ft)	260 m (854 ft)
Areas zoned or designated Residential, Institutional, Active Recreational, or Commercial Urban Area	415 m (1360 ft)	521 m (1709 ft)
Nearest side or rear lot line	41 m (136 ft)	52 m (171 ft)
Nearest road allowance (side or front lot line)	52 m (170 ft)	65 m (214 ft)

Site Characterization

The regulation requires an engineer or geoscientist to complete a site characterization of the soils and groundwater table near or around the area adjacent to the proposed permanent liquid nutrient storage facility (or permanent solid nutrient storage facility with an earthen floor). This will determine the design parameters to be followed for the manure storage and gutters in the barn.

Once the site characterization is completed, the storage (or barn with storage) design can proceed. Ross has two options for obtaining building plans. The first option would be to hire a builder who has a set of engineered drawings that can be modified to meet his needs. The second option would be to hire an engineer to do the barn plans and then send out tenders to a number of contractors for bids on the project.

Manure Storage Capacity

The existing 34 m (110 ft) diameter x 3.7 m (12 ft) deep manure tank has provided 240 days of storage in the past. The regulation requires a minimum of 240 days of storage. Ross will need to maintain his minimum 240 days of storage capacity with the additional number of cows.

His options are to build a new manure storage tank to hold all the liquid manure or to build a smaller storage tank and use a system that allows manure transfer between the new barn and the new and old manure storage tanks. Building the smaller tank and having manure transfer would save Ross approximately $40,000 compared to building a larger storage tank. Ross decided that the larger unit was worth the extra money because it would facilitate further expansion later on. He chose straw as the bedding type, although the building contractor also provided a feasible option for sand bedding.

The bedded packs for calves, heifers, and dry cows were projected to have 50% of manure as solid in the pack itself, and 50% of manure as liquid in the scrape alley. Liquid manure from the old tie-stall barn is scraped to a gutter cleaner that empties into a pump, that then empties into the long term liquid manure storage.

Spreading Restrictions

Ross reviewed the NMP prepared by his consultant and noted some restrictions that will reduce the amount of land that is available for manure application. The spreading limitations are specific to the features of Ross's fields, the method of manure application used and the composition of the manure.

Buffer Zones

Ross has two tributaries to the Thames River located on his farms. One is on the Home Farm and the other is on the New Farm. A small pond is located on the Simpson Farm as well. These are all illustrated in Appendix B. The necessary setback distances were determined by the NMAN program. A vegetative buffer zone of 3 m (10 ft) must be established next to any surface water that supports aquatic-type plants. This does not, for example, apply to a grassed waterway or a roadside ditch that has no stream. Ross will not spread any manure within the remainder of the setback areas.

Water Wells

Ross has a drilled well on the Home Farm. Because of this, the sections of the regulation related to water wells apply to his NMS/P. No manure may be applied within 15 m (50 ft) of a drilled well.

Method of Application

In the past, Ross used his own high-trajectory irrigation gun to spread the manure. These systems are no longer allowed under the NMA Regulation, except in cases where they are used to apply material that is less than 1% dry matter. Ross decided to convert his manure application system to a drag-hose type to use some of his existing equipment and reduce the cost of going to an entirely new application method. He plans to use a rear-discharge solid manure spreader for the manure from the bedded packs.

Dairy Management Options

The amount of phosphorus in the manure is the main limitation for manure application. This is the situation with most dairy farms.

It is possible to achieve significant reductions in the amount of nitrogen and phosphorus that dairy cows excrete in their manure. Some methods of achieving these reductions are to:

- test forage regularly to ensure accurate ration balancing
- have the rations balanced frequently and whenever a change occurs
- group cows based on production and nutritional needs
- test for Total Mixed Ration (TMR) mixing accuracy and ration-delivery accuracy
- reduce dietary phosphorus to current recommended levels
- monitor milk urea nitrogen to detect ration imbalances of protein or energy

These practices have the potential to reduce nutrient excretion of nitrogen and phosphorus by 15-20% on dairy farms. Other strategies such as recycling water can also reduce cost by reducing manure volumes. New strategies and opportunities are often best implemented when expansion plans are first considered. Reductions in nutrient output directly reduce the amount of land necessary for manure application.

Implications of the Nutrient Management Plan - A Summary

The following is intended to provide an overview of the changes occurring on this farm. It also provides a summary of the production implications of the nutrient management plan associated with the expanded dairy operation.

ROSS JOHNSON FARMS

This is a new Nutrient Management Plan Application.

Applicant:

Ross Johnson

Ross Johnson, R. R. #10, Zorra, N0E 1K0
Phone: 519-111-1234 911 Address: 12345

Ross Johnson Farms is a family-owned dairy operation located in Zorra Township in Oxford County. The business is run as a sole proprietorship owned by Ross Johnson. The family plans to expand and build a new free-stall dairy barn. Since manure is generated on only one property and manure is applied to all the land Ross owns, Ross will include all of the land that he owns in his farm unit.

Property Description:

Home Farm: Concession 1, Lot 1, Zorra Township (formerly West Zorra), Oxford County.
911 number 12345. Roll number 111.

Tillable Area: 69.3 ha (171 ac)
Area Available for Manure Application: 67.9 ha (168 ac)
Number of Fields: 3

- Field 1: 20.7 ha (51 ac) tillable; 20.3 ha (50 ac) is available for nutrient application. A 15 m (50 ft) setback from the drilled well on the farm is required.
- Field 2: 20.3 ha (50 ac) tillable; 19.4 ha (48 ac) is available for nutrient application. A creek runs through the back corner of this field. The required setback results in a 0.9 ha (2 ac) area where no manure may be applied.
- Field 3: 28.4 ha (70 ac) tillable; 28.3 ha (70 ac) available for nutrient application.

Manure is generated on this property. Manure and commercial fertilizer are applied to this property.

New Farm: Concession 2, Lot 3, Zorra Township (formerly West Zorra), Oxford County.
911 number 12366. Roll number 222.

Tillable Area: 50.6 ha (125 ac)
Area Available for Manure Application: 49.4 ha (122 ac)
Number of Fields: 2

- Field 1: 24.3 ha (60 ac) tillable; 24.3 ha (60 ac) is available for nutrient application.
- Field 2: 26.3 ha (65 ac) tillable; 25.1 ha (62 ac) available for nutrient application. A creek runs through the front corner of this field. The required setbacks result in 1.2 ha (3 ac) of land where manure may not be applied. Manure and commercial fertilizer are applied to this property.

Simpson Farm: Concession 1, Lot 4, Zorra Township (formerly West Zorra), Oxford County.
911 number 12377. Roll number 333.

Tillable Area: 65.6 ha (162 ac)
Area Available for Manure Application: 64.8 ha (160 ac)
Number of Fields: 3

- Field 1: 21.1 ha (52 ac) tillable; 21.1 ha (52 ac) is available for nutrient application.
- Field 2: 21.9 ha (54 ac) tillable; 21.9 ha (54 ac) available for nutrient application.
- Field 3: 22.7 ha (56 ac) tillable; 21.9 ha (54 ac) available for nutrient application. A pond is located in this field, resulting in 0.8 ha (2 ac) of land where no manure may be applied.

Manure and commercial fertilizer are applied to this property.

Area Summary:

Total Area Owned:	197.2 ha (487 ac)
Total Tillable Area:	185.5 ha (458 ac)
Total Area Available for Manure Application:	182.2 ha (450 ac)
Rented:	0 ha (0 ac)
Manure Agreement:	0 ha (0 ac)

Barns:

All barns and manure storages are on the Home Farm.
Existing Barns:

tie-stall barn	46 m (150 ft) x 18 m (60 ft); converted to dry cows and heifers
bedded pack dimensions	46 m (150 ft) x 9 m (30ft) x 0.8 m (2.5 ft)
free-stall barn	35 m (116 ft) x 28 m (92 ft); 4 row tail-to-tail; washwater added to manure tank

Proposed Barns:

new free-stall barn	79 m (260 ft) x 29 m (94 ft)
tie-stall barn	46 m (150 ft) x 18 m (60 ft); converted to calves and heifers
bedded pack dimensions	35 m (116 ft) x 19 m (62ft) x 0.8 m (2.5 ft)
free-stall barn	35 m (116 ft) x 28 m (92 ft); converted to dry cows and heifers

Manure Storage:

Existing:	34 m (110 ft) x 4 m (12 ft); open top circular concrete tank 30 m (100 ft) x 2.4 m (8 ft) x 2.4 m (8 ft); collection/transfer tank in old free-stall barn; solid manure stored in place in bedded pack
Proposed:	46 m (150 ft) x 4 m (12 ft); open top circular metal tank

Combination of existing and proposed storage provides 245 days of permanent manure storage.

Livestock:

Existing:	100 Holstein milk cows plus replacements
Proposed:	200 Holstein milk cows plus replacements

Cropping:

All lands will be in a 1 year of corn, 1 year of winter wheat and 3 years of alfalfa hay and haylage rotation. The regulation requires that all fields be sampled as part of preparing the NMP (see S.91 of the regulation for sampling requirements) and that the samples be analyzed by an OMAFRA accredited laboratory. A good soil-sampling program monitors soil nutrient levels and prevents over application of nutrients. Appendix C indicates the soil lab test results for this operation. It is recommended that you do one test per every 10 ha (25 ac) when initially assessing the existing fertility of a field.

Verification of actual crop yields is important as the amount of manure that may be applied is partially controlled by the actual yield achieved on a per field basis. Crop rotation records should be maintained, as different crops will result in different rates of manure application.

Manure Application and Analysis:

Since the farm unit is preparing a NMP there should be a manure sample or obtain the default data from the Nutrient Management Protocol. However more regular manure analyses are recommended. A good representative sample will allow for the correct nutrient credits to be used for maximum crop growth and prevent over-application of manure and/or commercial fertilizer. Manure application on this operation will be by drag-hose and rear-discharge spreader. The NMP will detail the volume and timing of manure applications that may be applied to each field.

The area of the cultivated field adjacent to the buffer zone has restrictions as to application of nutrients. At a minimum, this zone must be 10 m (33 ft) wide, and manure and commercial fertilizers must be injected or incorporated within 24 hours unless there's a living crop or at least 30% crop residue. If the soil fertility levels, particularly phosphorus, are high, this zone may be wider, as determined by the NMAN program. Ross has taken soil samples on a regular basis, and phosphorus has been within normal levels and should not pose a problem.

Spreading Restrictions:

Establishment and maintenance of a vegetated buffer zone or setback along open ditch and creek areas to prevent manure and soil from entering these sensitive areas is a best management practice and a requirement under the regulation. There are two creeks that run through this farm property. One is on the Home Farm and the other creek is on the New Farm. As set out in the NMP, specific setbacks must be maintained along these watercourses.

A vegetated buffer zone of a minimum of 3 m (10 ft) must be established next to the creeks as they would be classified as surface water. Within the remainder of the setback areas, Ross will not spread any manure. Establishment and maintenance of appropriate setbacks to wells is also a best management practice and requirement under the regulation. A drilled well exists on the Home Farm near field 1. No manure (or other agricultural source materials) may be applied within 15 m (50 ft) of this well.

Spreading restrictions associated with this plan are illustrated in Appendix B.

MDSII:
To satisfy municipal requirements, the new barn must be kept a minimum of 230.9 m (757 ft) from the nearest neighbour's dwelling. The proposed site for the barn can meet all required MDSII requirements. The MDSII distance is illustrated in Appendix B.

Contingency Plan:
Even with the best planning, circumstances can change, requiring you to alter how you store, apply and handle your manure. A good contingency plan will be useful in emergencies.

A sample contingency plan for this operation can be found in Appendix D.

Conclusion

The regulation requires farmers wanting to expand their existing operation or to build a new livestock barn that contains nutrient storage to meet new permit and plan requirements. Know what is required under the regulation. Getting all the facts ahead of time can help prevent costly and unnecessary delays.

Farmers should have a thorough understanding of the NMS/P to implement their plan and maximize the agronomic and economic value of their manure. Regardless of who completes the NMS/P, the farm operator is responsible for implementation of the plan and monitoring of all activity regulated under the plan.

A selection of the most common forms that are part of a NMS/P are included in the Appendices. Appendices A and C are concept sketches of a Farm Unit Sketch and a Field Sketch. The sketches do not show all of the details that may be required for an approved sketch. Specific details required in a sketch can be found in the Nutrient Management Regulation 267/03, as amended, and the associated Nutrient Management Protocol, Parts 5 and 7. These items are also available at www.omafra.gov.on.ca. The following chart (Farmstead or Field Sketch Requirements) lists the items that may or may not be needed to complete the sketches.

The following items may or may not be needed as part of your Farmstead or Field Sketches. Refer to Regulation 267/03, as amended, and the associated protocols to determine your sketch requirements.

Farmstead Sketch

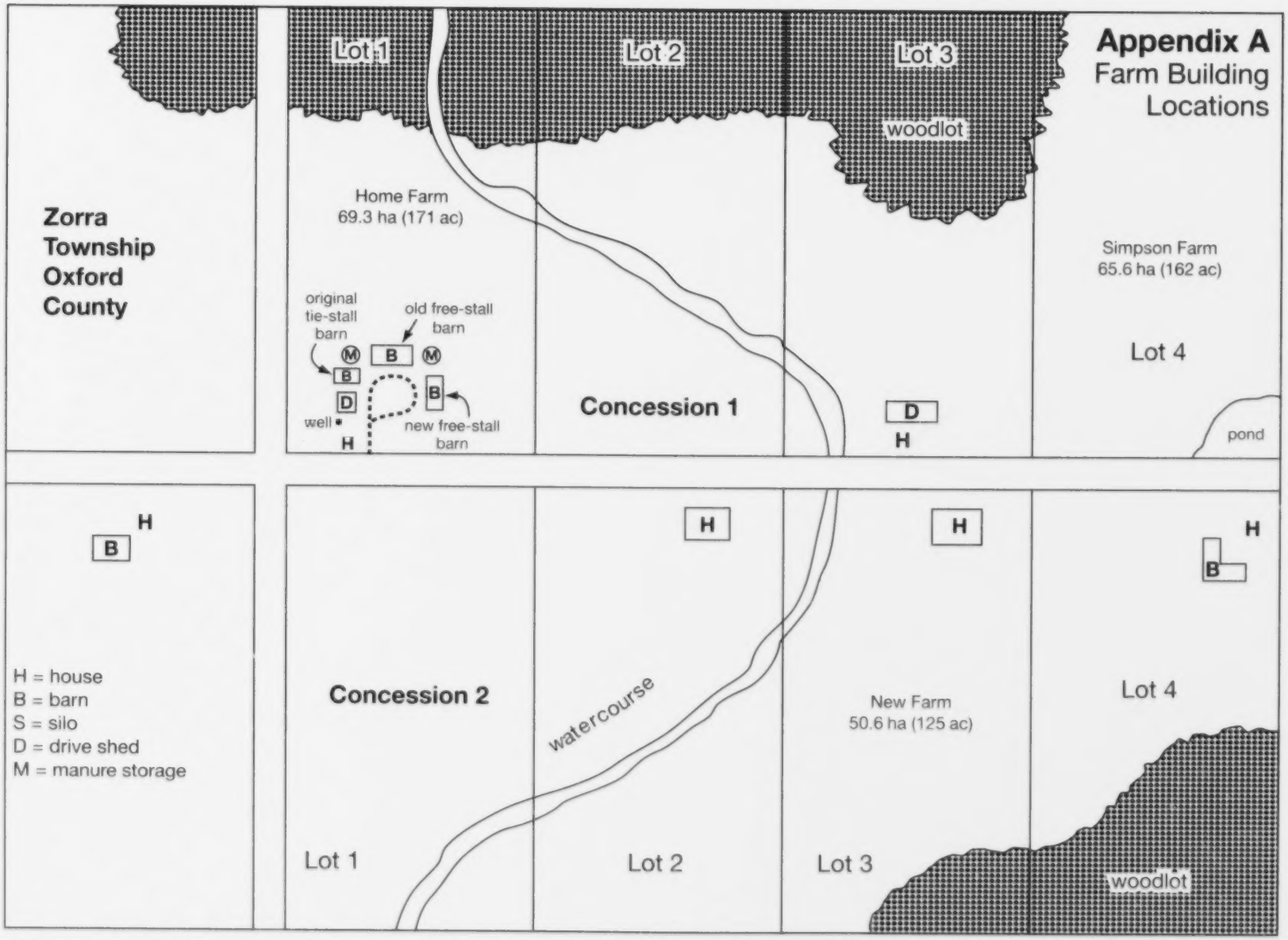
1. North direction arrow
2. Property identifier
3. Label whether the land is owned, controlled (rented or leased) or if there is an application agreement
4. Road names, municipal boundaries, neighbours and other local features
5. Permanent, temporary and proposed generating facilities
6. Permanent, temporary and proposed generating facilities and sites
7. Dimensions of all generating and storage facilities and sites
8. Location of flow paths and physical barriers*
9. Location and distance of wells (includes gas, oil, test and water wells) within regulated distances
10. Location and distance of municipal wells within regulated distances
11. Location and distance of tile inlets
12. Location and distance of surface water

** Including these items as part of a sketch may facilitate the approval of your application by providing details required as part of compliance with Regulation 267/03, as amended.*

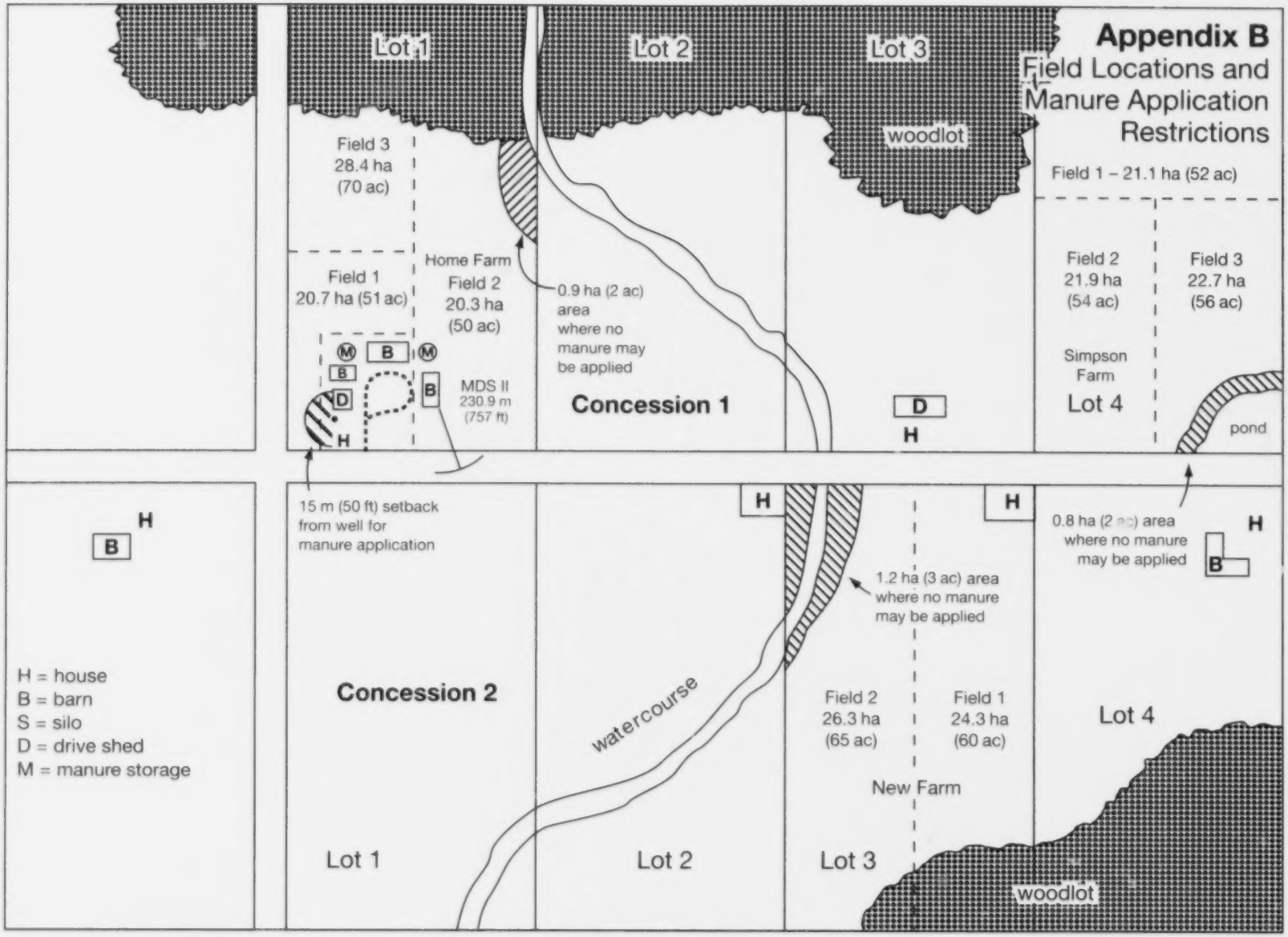
Field Sketch

1. Field identifier (from Farm Unit declaration)
2. Section within a field that has more than one section
3. Identify w'ıether tile drains exist
4. Location of tile inlets*
5. Location of tile outlets*
6. Location of surface water within 150 m (492 ft) of the field*
7. Location of non-agricultural land uses
8. Location of municipal wells within 100 m (328 ft) of a field boundary
9. Location of all other known wells within 90 m (295 ft) of the field boundary if the field is receiving biosolids
10. Location of all other known wells within 30 m (98 ft) of the field boundary if the field is only receiving agricultural source material
11. Setback distances required from all wells*
12. Maximum sustained field slope*
13. Maximum sustained field slopes within 150 m (492 ft) of the top of the bank of all surface water
14. Setback distances required from surface water established by the minimum separation distance and/or the phosphorus index
15. Location of all permanently vegetated buffer zones*

** Including these items as part of a sketch may facilitate the approval of your application by providing details required as part of compliance with Regulation 267/03, as amended.*



Appendices A and B are concept sketches of a Farm Unit Sketch and a Field Sketch. The sketches do not show all of the details which may be required for an approved sketch. Specific details required in a sketch can be found in the Nutrient Management Regulation 267/03, as amended and the associated Nutrient Management Protocol, Parts 5 and 7. These items are available at www.omafra.gov.on.ca.



Appendices A and B are concept sketches of a Farm Unit Sketch and a Field Sketch. The sketches do not show all of the details which may be required for an approved sketch. Specific details required in a sketch can be found in the Nutrient Management Regulation 267/03, as amended and the associated Nutrient Management Protocol, Parts 5 and 7. These items are available at www.omafra.gov.on.ca.

Soil-Ag
Lab Services
(An OMAFRA Accredited Lab)

Unit A - 10 Dirt Street
HOMETOWN, Ontario A0A 0A0

Soil Test Report

Date Submitted: May 20, 2005.
Report Date: April 1, 2005.

Customer	Sample ID	Lab#	pH	BpH	Organic Matter %	NO_3-N (ppm)	$NaHCO_3$ Test Phosphorus (ppm)	Potassium (K) (ppm)	Magnesium (ppm)	Calcium (ppm)
JohnsonHome-F1		574	7.2		3.3		43	199	112	
JohnsonHome-F1		575	6.8		3.4		47	200	135	
JohnsonHome-F2		576	6.9		3.4		41	202	122	
JohnsonHome-F2		577	7.1		3.4		48	198	132	
JohnsonHome-F2		578	7.2		3.3		43	197	128	
JohnsonHome-F3		579	7.2		3.3		43	199	112	
JohnsonHome-F3		580	6.8		3.4		47	200	135	
Johnson New-F1		581	6.9		3.2		21	201	127	
Johnson New-F1		582	7.4		2.4		20	178	142	
Johnson New-F1		583	7.1		3.0		19	200	147	
Johnson New-F2		584	7.2		2.9		22	190	149	
Johnson New-F2		585	7.0		3.1		14	192	130	
Johnson New-F2		586	7.0		3.5		26	210	142	

Soil-Ag
Lab Services
(An OMAFRA Accredited Lab)

Unit A - 10 Dirt Street
HOMETOWN, Ontario A0A 0A0

Soil Test Report

Date Submitted: May 20, 2005.
Report Date: April 1, 2005.

Customer	Sample ID	Lab#	pH	BpH	Organic Matter %	NO_3-N (ppm)	$NaHCO_3$ Test Phosphorus (ppm)	Potassium (K) (ppm)	Magnesium (ppm)	Calcium (ppm)
Johnson	Home-F1	585	7.2		3.3		43	199	112	
Johnson	Home-F1	586	6.8		3.4		47	200	135	
Johnson	Sim-F1	587	7.2		3.3		18	199	112	
Johnson	Sim-F1	588	6.8		3.0		22	200	127	
Johnson	Sim-F1	589	7.5		2.6		25	214	122	
Johnson	Sim-F2	590	7.1		2.8		27	212	118	
Johnson	Sim-F2	591	7.2		3.3		19	219	112	
Johnson	Sim-F2	592	7.4		3.0		22	200	124	
Johnson	Sim-F3	593	7.4		2.9		26	179	127	
Johnson	Sim-F3	594	6.9		3.1		28	191	119	
Johnson	Sim-F3	595	7.2		3.0		27	186	122	

EMERGENCY CONTACT TELEPHONE NUMBERS:

Spills Action Centre	1-800-268-6060
Ministry of the Environment (Local Office)	1-222-333-4444
Backhoe Operator: Excavations Inc.	1-222-333-4444
Dump Truck Operator: Dumptrucks Ltd.	1-222-333-4444

ON-SITE EMERGENCY EQUIPMENT

Solid manure spreader • Tractor • Skidsteer loader

This contingency plan sets out possible actions that can be taken in the event that this Nutrient Management Strategy and Plan cannot be followed.

STORAGE:

Liquid Runoff From Storage Facility

- This facility should be periodically monitored to ensure that no liquids are escaping the storage facility.
- Liquids in the storage facility could be removed with a vacuum tank and, if conditions will allow, field applied or transferred to a proper storage facility.
- A berm may be constructed to prevent liquids from migrating into surface waterways.

MORE NUTRIENT THAN THE NUTRIENT MANAGEMENT STRATEGY OR NUTRIENT MANAGEMENT PLAN HAVE ADDRESSED

If the application rates for nutrients in a nutrient management plan are not at the maximum, the nutrient management plan can be reviewed to ascertain whether the application rate and possibly the frequency of application can be increased for certain parts of land. Any changes made to the nutrient management plan must be recorded to reflect the actual amount of nutrient applied. In some cases this may mean an updating of the nutrient management plan is necessary.

If the application rates for nutrients in a nutrient management plan are at the maximum, the operator must be prepared to set up alternate uses for the nutrient. Some possibilities include:

- finding a broker who can take the excess nutrient (a Broker Agreement would be required in such circumstances),
- finding an intermediate generator who will accept the excess nutrient (a Nutrient Transfer Agreement would be required in such circumstances)
- acquiring more land through ownership, control or other arrangements.

MORE NUTRIENT THAN THE STORAGE DESIGN CAPACITY

In some cases, generally due to adverse weather conditions, the storage may not be sufficient to store all manure produced. To overcome this problem, the preferred solution would be to land-apply the manure where doing so will not result in an adverse effect.

Options

- Alter your Nutrient Management Plan if the application rates are not already at the maximum and renew if required by the regulation.
- Transfer the nutrient to an available storage facility with excess capacity (a Nutrient Transfer Agreement may be required).
- Work with your broker to take the excess.
- Obtain access to more land through ownership or by means of an Application Agreement or land rental.
- Transfer to a non-regulated farm, and document.
- Utilize temporary in-field storage.
- Use in-barn storage between crop clean outs to extend the capacity of the storage.

AGRICULTURAL OPERATIONS: UNANTICIPATED RELEASE OF NUTRIENTS

These are important issues to be dealt with in a contingency plan due to the adverse effects that can occur. The contingency plan must outline the required equipment, contacts and safety precautions. The idea is to minimize the potential for a spill and if one does occur to ensure that the operator and the employees know what actions to implement.

TO AVOID A SPILL YOU SHOULD:

- calibrate your manure application equipment to apply at rates indicated in your NMP;
- avoid spreading solid manure closer to a watercourse than indicated by your NMP;
- do not apply manure on steep slopes and avoid spreading on snow or prior to rainfall; and
- do not apply manure within 30 m (100 ft) of a dug well or within 15 m (50 ft) of a drilled well.

IF A SPILL DOES OCCUR:

- immediately shut down cause of spill;
- contain the material to minimize opportunity for material to move off site;
- notify the Spills Action Centre;
- clean up the spill and land apply the material in accordance with the Nutrient Management Plan or return the material to storage; and
- re-evaluate manure handling procedures and the effectiveness of the contingency plan.

WEATHER OR EQUIPMENT CONDITIONS IMPEDING PLANNED STORAGE OR APPLICATION

Manure Application Change

- When the timing of a manure application must be changed, adjust the nutrient amounts to reflect the change in application timing.
- In making such changes, you must not exceed the maximum annual nutrient application rate or the maximum rate per application.
- The application rate must comply with the requirements of the Regulation.
- Adjust subsequent applications of nutrients to accommodate the change in timing of the nutrient application and record the change in your NMP.

Crop Change

- Nutrient amounts and formulation should be adjusted (where possible) to account for a change in designated crop.
- If the nutrients have already been applied, the amount and formulation should be adjusted for the next crop to be grown, where possible, to account for the previous crop change.

Commercial Fertilizer Material or Analysis Change

- Where the nutrient composition that is listed in the NMP is altered, the altered material or analysis should be reflected in the NMAN plan.
- Subsequent nutrient applications should reflect these changes to the original NMP.

Appendix E - Farm Unit Declaration

Ontario Ministry of Agriculture, Food and Rural Affairs

Farm Unit Declaration Form

General Information

A Farm Unit as defined by the *Nutrient Management Act, 2002*, Ontario Regulation 267/03 is the basis for a Nutrient Management Strategy and/or Nutrient Management Plan.

For each Farm Unit there is only one Nutrient Management Strategy and one Nutrient Management Plan.

The Farm Unit must include all land on the property where the nutrients are generated.

The Farm Unit may include other properties.

Contact Information

Name of Farm Unit Operator

Legal Farm Name

Address (Street No., Street Name, Lot, Concession, Township)

City/Town/Village, R.R.	Province	Postal Code
	Ontario	

Telephone No. (incl. Area code)	Operation Identifier (if previously assigned by Ministry)

Location of all the Generating and Storage Facilities that are part of this Farm Unit

	Type of Facility	Lot and Concession	Township	County	Roll Number
1.	☐ Existing ☐ Proposed				
2.	☐ Existing ☐ Proposed				
3.	☐ Existing ☐ Proposed				
4.	☐ Existing ☐ Proposed				
5.	☐ Existing ☐ Proposed				
6.	☐ Existing ☐ Proposed				
7.	☐ Existing ☐ Proposed				
8.	☐ Existing ☐ Proposed				

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Operation Information

Operation Identifier *(if previously assigned by Ministry)*

Number of Livestock for Each Generating Facility Listed in the Previous Table.

(Complete the information below using the same row number for each facility in the previous table, and using the three (3) livestock categories listed in the attached Reference Table)

Row No.	Generating Facility	Type of Livestock	Number of Livestock

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Appendix E - Farm Unit Declaration

Location and Identification of Land that is Part of this Farm Unit

Give each farm or field a unique name that will also be used in the Nutrient Management Plan for this Farm Unit. For properties included under agreements, attach copies of the agreements.

Farm or Field Name	Lot and Concession	Township and County	Former Township (if applicable)	Tillable Area	Roll Number	911 Location	Farm/Field is Owned or Rented (check ☒ one)
							☐ Owned ☐ Rented ☐ Agreement
							☐ Owned ☐ Rented ☐ Agreement
							☐ Owned ☐ Rented ☐ Agreement
							☐ Owned ☐ Rented ☐ Agreement
							☐ Owned ☐ Rented ☐ Agreement
							☐ Owned ☐ Rented ☐ Agreement

A non-agricultural source material is or will be applied to one or more of the properties listed as part of this farm unit: ☐ Yes ☐ No

A municipal well is located within 100 metres of any of the properties listed as part of this farm unit: ☐ Yes ☐ No

☐ Additional facilities listings are attached.

☐ Additional land listings are attached.

Declaration

I, (farm unit operator or authorized agent) declare that the facilities and property referred to on this form comprise the entirety of this Farm Unit. I acknowledge the requirement to complete a Nutrient Management Plan and/or Strategy, and that such Nutrient Management Plan and/or Strategy shall include all of the lands identified on this form.

I hereby warrant that the information contained on this form is true, and that I have authority to complete this document.

Indicate the type of operation that this Farm Unit is in: *(check ☒ one only)*

☐ Corporation *(specify name below)*

☐ Division of a Corporation *(specify name below)*

Name of Corporation **or** Division of Corporation

☐ Partnership *(specify names and addresses of Partners below)*

☐ Sole Proprietorship *(specify name and address of Owner below)*

Names and Addresses of Partners or Name and Address of Owner

Name of Farm Unit Operator/Authorized Agent *(please print)*	Signature	Date *(yyyy/mm/dd)*
Name of Witness *(please print)*	Signature	Date *(yyyy/mm/dd)*

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Reference Table for Determining Type of Livestock

Type of Livestock			
Type	**Sub Type**	**Sub-sub Type**	**Nutrient Units (animals/NU)**
Beef	Backgrounders (7-12.5 months)	Confinement	3
Beef	Backgrounders (7-12.5 months)	Yard/Barn	3
Beef	Cows (includes calves to weaning)	Confinement	1
Beef	Cows (includes calves to weaning)	Deep Bedded	1
Beef	Cows (includes calves to weaning)	Yard/Barn	1
Beef	Feeders (7-16 months)	Confinement	3
Beef	Feeders (7-16 months)	Confinement Bedded Pack	3
Beef	Feeders (7-16 months)	Confinement Total Slats	3
Beef	Feeders (7-16 months)	Yard/Barn	3
Beef	Short Keep (12.5-17.5 months)	Confinement	2
Chickens	Broiler Breeder Growers (females + males transferred out)	Floor System	300
Chickens	Broiler Breeder Layer (females + males transferred in)	Cages	100
Chickens	Broiler Breeder Layer (females + males transferred in)	Litter With Slats	100
Chickens	Broilers	8 Week Cycle	351
Chickens	Broilers	9 Week Cycle	300
Chickens	Broilers	10 Week Cycle	250
Chickens	Broilers	12 Week Cycle	199
Chickens	Layer Pullets (day olds)	Cages	500
Chickens	Layer Pullets (day olds)	Litter	500
Chickens	Laying Hens	Belt And Other Removal System (daily)	150
Chickens	Laying Hens	Belt With Air Drying (daily)	150
Chickens	Laying Hens	High Rise - Stored In Barn	150
Chickens	Laying Hens	Liquid - Stored In Barn	150
Chinchilla	Breeding Females (incl. males/rep/market animals)		320
Dairy	Calves Large Frame		6
Dairy	Calves Medium Frame (Guernsey Size)		7
Dairy	Calves Small Frame (Jersey Size)		8.5
Dairy	Heifers Large Frame	Deep Bedded	2
Dairy	Heifers Large Frame	Free Stall	2
Dairy	Heifers Large Frame	Manure Pack Outside Access	2
Dairy	Heifers Large Frame	Pack Scrape 1 Side	2
Dairy	Heifers Large Frame	Pack Scrape 2 Sides	2
Dairy	Heifers Medium Frame (Guernsey Size)	Deep Bedded	2.4
Dairy	Heifers Medium Frame (Guernsey Size)	Free Stall	2.4
Dairy	Heifers Medium Frame (Guernsey Size)	Pack Scrape	2.4
Dairy	Heifers Small Frame (Jersey Size)	Deep Bedded	2.9
Dairy	Heifers Small Frame (Jersey Size)	Free Stall	2.9
Dairy	Heifers Small Frame (Jersey Size)	Pack Scrape	2.9

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Reference Table for Determining Type of Livestock - continued

Type of Livestock			
Type	**Sub Type**	**Sub-sub Type**	**Nutrient Units (animals/NU)**
Dairy	Milking Age Cows Large Frame	4 Row Free Stall Head To Head	0.7
Dairy	Milking Age Cows Large Frame	4 Row Free Stall Tail To Tail	0.7
Dairy	Milking Age Cows Large Frame	6 Row Free Stall	0.7
Dairy	Milking Age Cows Large Frame	Bedded Pack	0.7
Dairy	Milking Age Cows Large Frame	3 Row Free Stall	0.7
Dairy	Milking Age Cows Large Frame	Sand	0.7
Dairy	Milking Age Cows Large Frame	Tie Stall	0.7
Dairy	Milking Age Cows Medium Frame (Guernsey Size)	Bedded Pack	0.85
Dairy	Milking Age Cows Medium Frame (Guernsey Size)	Free Stall	0.85
Dairy	Milking Age Cows Medium Frame (Guernsey Size)	Tie Stall	0.85
Dairy	Milking Age Cows Small Frame (Jersey Size)	Bedded Pack	1
Dairy	Milking Age Cows Small Frame (Jersey Size)	Free Stall	1
Dairy	Milking Age Cows Small Frame (Jersey Size)	Tie Stall	1
Deer/Elk	Elk Adults (>24 months) (includes unweaned offspring)		2
Deer/Elk	Elk Feeders		6
Deer/Elk	Elk/Red Deer Hybrid Adults (includes unweaned offspring)		4
Deer/Elk	Elk/Red Deer Hybrid Feeders		10
Deer/Elk	Fallow Deer Adults (>24 months) (includes unweaned offspring)		13
Deer/Elk	Fallow Deer Feeders		23
Deer/Elk	Red Deer Adults (>24 months) (includes unweaned offspring)		7
Deer/Elk	Red Deer Feeders		14
Deer/Elk	White Tailed Deer Adults (>24 months) (includes unweaned offspring)		11
Deer/Elk	White Tailed Deer Feeders		21
Ducks	Peking	Breeders	105
Ducks	Peking	Growers	105
Emu	Adults (includes offspring to market size)		12
Fox	Breeding Females (includes rep/market animals/males)		25
Goats	Dairy Does (including unweaned offspring)	Confinement	8
Goats	Dairy Kids	Confinement	
Goats	Feeder Kids (>20 kg)	Confinement	
Goats	Mature Meat Goat (including unweaned offspring)		8

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Reference Table for Determining Type of Livestock - continued

Type of Livestock			
Type	**Sub Type**	**Sub-sub Type**	**Nutrient Units (animals/NU)**
Horses	Large Frame (including unweaned offspring)	Box Stalls	0.7
Horses	Medium Frame (including unweaned offspring)	Box Stalls	1
Horses	Small Frame (including unweaned offspring)	Box Stalls	2
Mink	Breeding Females (includes rep/market animals/males)		90
Ostrich	Adults (includes offspring to market size)		4
Rabbits	Breeding Does (includes bucks/rep/fryers)	1 Tier Cages	40
Rabbits	Breeding Does (includes bucks/rep/fryers)	2 Tier Cages	40
Rabbits	Breeding Does (includes bucks/rep/fryers)	3 Tier Cages	40
Sheep	Dairy and Feeder Lambs	Confinement	20
Sheep	Dairy and Feeder Lambs	Outside Access	20
Sheep	Dairy Ewes & Rams (including unweaned offspring and replacements)	Confinement	6
Sheep	Meat Ewes & Rams (including unweaned offspring and replacements)	Confinement	8
Sheep	Meat Ewes & Rams (including unweaned offspring and replacements)	Outside Access	0
Swine	Feeders	Full Slats	6
Swine	Feeders	Full Slats (wet/dry feeders)	6
Swine	Feeders	Deep Bedded	6
Swine	Feeders	Partial Slats	6
Swine	Feeders	Partial Slats (wet/dry feeders)	6
Swine	Feeders	Solid Scrape	6
Swine	Gilts - Breeders		5
Swine	Sows (dry) (AI)	non-SEW	3.64
Swine	Sows (dry) and Boars	non-SEW	3.5
Swine	Sows (dry) and Boars	SEW	3.33
Swine	Sows with Litters	non-SEW	3.5
Swine	Sows with Litters	SEW	3.33
Swine	Sows, boars, and litters	SEW	3.5
Swine	Weaners	non-SEW	20
Swine	Weaners	non-SEW (wet/dry)	20
Swine	Weaners	SEW	20
Swine	Weaners	SEW (wet/dry)	20

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Reference Table for Determining Type of Livestock - continued

Type of Livestock			
Type	**Sub Type**	**Sub-sub Type**	**Nutrient Units (animals/NU)**
Turkeys	Breeder Toms		
Turkeys	Broilers <6.2kg		133
Turkeys	Hens 6.2-10.8 kg		107
Turkeys	Toms >10.8 kg		76
Turkeys	Turkey Breeder Layers		
Turkeys	Turkey Pullet (0 to 6 weeks)		267
Veal	Grain Fed Veal		6
Veal	Milk Fed Veal		6

NOTE:

For animals not listed in the table above the number of animals per nutrient unit can be calculated by determining the number of animals that will produce the amount of nutrients that give the fertilizer replacement value of the lower of 43 kilograms of nitrogen or 55 kilograms of phosphate as nutrient. Consult with Ministry staff if assistance is required to complete this calculation.

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Attach any additional information on this page.

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Appendix F - Nutrient Management Strategy and/or Plan Sign-Off Form

Ontario Ministry of Agriculture, Food and Rural Affairs

Nutrient Management Strategy *and/or* Plan Sign-Off Form

Contact Information

Name of Operator

Address *(Street No., Street Name, Lot, Concession, Township)*

City/Town/Village, R.R.	*Province* Ontario	*Postal Code*

Telephone No. *(incl. Area Code)*	Operation Identifier *(if previously assigned by Ministry)*

Notice of Collection

Personal information provided in the application is collected under the authority of the *Nutrient Management Act, 2002*, Ontario Regulation 267/03 s. 16, 17 and 24. It will be used for the review, approval, enforcement and audit of the strategy or plan, as the case may be. The information may be made available to external experts contracted by OMAFRA for advice during review and approval or to Ministry of the Environment for advice during review and approval or for enforcement purposes. A public record of approved strategies may be made available to the public by publication in print or over the World Wide Web.

Data from plans and strategies may be aggregated without personal identifiers and made available to researchers for evaluation of the program and other matters related to nutrient and environmental management that may be in the public interest. Questions about this collection should be directed to:

Manager, Approvals, Nutrient Management Branch, Ministry of Agriculture, Food and Rural Affairs, 1 Stone Road West, Guelph ON N1G 4Y2, Telephone: 519-826-6368.

Provision of False Information in this Application

Any false or misleading information submitted by the applicant in this document may result in the invalidation of any approvals or permits granted, and prosecution in accordance to the provisions of the *Nutrient Management Act, 2002*.

Applicant Declaration

I, the applicant (farm unit operator or authorized agent), hereby certify that

a. to the best of my knowledge, excluding unforeseen or uncontrollable circumstances, the information contained in this application provides an accurate description of the existing and proposed operation over the time period covered by this plan or strategy,

b. I understand that in the course of the administration of the Act, the Ministry may provide the information contained in this application to external agents or the Ministry of the Environment for review and analysis, and authorize the Ministry to provide this information to its external agents, and authorize its external agents or the Ministry of the Environment to collect this information from the Ministry, and

c. I, the applicant, ☐ authorize *OR*
☐ do not authorize
the individual who prepared this strategy and/or plan as noted below, to act as my agent for the purposes of obtaining approval for this application, and to provide the Ministry, or its agents, any information required in the review of this application.

Name of Applicant *(please print)*	Signature	Date *(yyyy/mm/dd)*

Declaration of Individual who Prepared this Strategy and/or Plan

I, the individual who prepared this strategy and/or plan, hereby certify that based on relevant information provided in good faith and excluding unforeseen or uncontrollable circumstances, the recommendations contained in this application will, if implemented, result in acceptable management practices in accordance to the regulation and protocols under the *Nutrient Management Act, 2002*.

Certification No. *(if applicable)*

Name of Individual who Prepared this Strategy and/or Plan *(please print)*	Signature	Date *(yyyy/mm/dd)*

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Ontario Ministry of Agriculture, Food and Rural Affairs

Engineer's Commitment Certificate

Project Information

Name of Project

Address *(Street No., Street Name, Lot, Concession, Township)*

City/Town/Village, R.R.	*Province*	*Postal Code*
	Ontario	

Applicant Declaration

This is to certify that I understand that under the *Nutrient Management Act, 2002*, I am required to retain engineering services for specific projects and situations.

Name of Owner *(please print)*	Signature	Date *(yyyy/mm/dd)*

Therefore I have retained the following Professional Engineer,

Name of Professional Engineer *(please print)*	Signature	Date *(yyyy/mm/dd)*

to undertake the overall coordination and completion of the engineering design and general review of construction; ***or***

I have retained the following Professional Engineers to provide engineering services for the following components of the engineering design and review of construction.

Project Components Information

Design Components	Engineer's Information	
Site Characterization* - sub-surface information, soil properties, water table and bedrock location (if critical).	Name of Engineer	Telephone No. *(incl. Area Code)*
	Address	Signature
Liquid Storage Facilities - drawings and design details for liquid storage construction.	Name of Engineer	Telephone No. *(incl. Area Code)*
	Address	Signature
Solid Storage Facilities - drawings and design details for solid storage construction (if applicable).	Name of Engineer	Telephone No. *(incl. Area Code)*
	Address	Signature

Appendix G - Engineer's Commitment Certificate

Design Components	Engineer's Information	
Earthen Storage Facilities - drawings and design details for earthen storage construction.	Name of Engineer	Telephone No. *(incl. Area Code)*
	Address	Signature
Synthetic or Natural Liner - design details, including details of inspection and testing of seams.	Name of Engineer	Telephone No. *(incl. Area Code)*
	Address	Signature
Transfer Systems - drawings and design details for connections, materials, etc.	Name of Engineer	Telephone No. *(incl. Area Code)*
	Address	Signature

* Geoscientist retained to perform a Site Characterization evaluation must be a member of the Association of Professional Geoscientists of Ontario.

Special thanks to all those who have contributed to this publication by lending their expertise and resources.

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To Obtain More Information:
A listing of other publications related to the Nutrient Management Act, 2002 and course information can be obtained from the OMAFRA website at www.omafra.gov.on.ca or by calling the Nutrient Management Information Line at 1-866-242-4460.

For information or to obtain copies of this or any other ministry publication, please call 1-888-466-2372 from within Ontario or OMAFRA's TTY line at (519) 826-7402 for the hearing impaired; e-mail your requests to products@omafra.gov.on.ca or visit the OMAFRA website at www.omafra.gov.on.ca. Orders can be faxed to (519) 826-3633 or mailed to Government Information Centre, OMAFRA, 1 Stone Road West, Guelph, ON N1G 4Y2.

DISCLAIMER:
This publication reflects the opinions of the contributing writers and is based on the information available as of the date of publication. It is based on a fictional property and fictional situation. It should not be regarded as an exact model for a Nutrient Management Plan. This publication may be updated as required.

Notes

Contact OMAFRA for more information:

Nutrient Management Information Line:
1-866-242-4460

E-mail:
nman@omafra.gov.on.ca

Web site:
www.omafra.gov.on.ca

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